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ABSTRACT

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Effectiveness of Avoidant Thinking and Redefinition in Coping with Stress

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Abstract

After receiving a sample shock, subjects in a Threat Condition were told that they would receive additional painful shocks while subjects in a Nonthreat Condition were not threatened with additional shocks. Subjects in an Avoidant Thinking Condition were then instructed to read and think about an amusing story, subjects in a Situation Redefinition Condition were instructed to write down reasons why they should not be afraid in this situation, and subjects in a Control Condition were not given any instructions for coping with stress. (Coping conditions were factorially crossed with Threat conditions and 192 subjects were employed.) Physiological measures (pulse rate, finger pulse volume, skin resistance) indicated that unlike the results of previous research, avoidant thinking was effective in reducing stress but situation redefinition was not. Discussion was focused on the parameters which determine whether or not a coping strategy will be effective.

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Two potential strategies for coping with stress are situation redefinition (i.e., reappraising a stressful situation as nonstressful) and avoidant thinking (i.e., focusing attention on a neutral or pleasant stimulus rather than on a stressful stimulus). Although these strategies have been discussed frequently by personality theorists (usually with regard to various ego defense mechanisms) and have been generally assumed to be effective for reducing stress, to this point relatively little experimental research has been conducted to actually assess their effectiveness for reducing stress. Furthermore, the investigations which have been reported leave many questions unanswered.

With regard to redefinition, a number of investigators (Barber & Coules, 1959; Barber & Hahn, 1962; Neufeld, 1970) have found that when exposed to pain (e.g., having their hands placed in extremely cold water) but instructed to redefine the experience as nonpainful (e.g., "imagine that the water is pleasant and try to think of it as not uncomforable"), subjects reported less pain than did subjects who were exposed to the pain but not instructed to redefine. It is important to note, however, that the differences in self-reports were not consistently mirrored in the subjects' physiological responses, thus suggesting that the differences in self-reports may have been superficial attempts to meet the demand characteristics established by the instructions (e.g., "I'm sure that you'll be able to continue imagining this and that you will not fail the test."). The famous series of experiments by Lazarus and his colleagues (e.g., Lazarus & Alfert, 1964; Lazarus, Opton, Nomikos, & Rankin, 1965; Spiesman, Lazarus, Mordkoff, & Davison, 1964) also fails to provide a clear answer for the question of whether subjects can reduce stress by redefinition because in those experiments the redefinition (viz., denial & reaction formation) manipulation reduced the stress in the situation for the subjects rather than encouraged the subjects to use redefinition for themselves to cope with the stress. That is, in the redefinition condition, the experimenter told the subjects that the situation was not stressful, thereby changing the stimulus situation, rather than acknowledging the stress but asking the subjects to deal with it by attempting to redefine it. The results of the experiments by Lazarus and his colleagues are also limited in that the subjects were not threatened directly but rather threatened vicariously by being shown a movie of other persons being harmed. Most recently, it was reported that when directly threatened with the possibility of electical shocks, subjects who were instructed to redefine the shocks as "interesting new physiological sensations" reported less anxiety and showed less physiological arousal than did subjects who were not given the instructions to redefine the shocks (Holmes & Houston, 1974). In considering this experiment, however, it should be noted that the subjects were never actually exposed to shocks and therefore the stressful stimulus was very ambiguous. Stimulus ambiguity may have facilitated redefinition but it limits our ability to generalize to the probably more frequent situation where the threat is clearly defined. Obviously, our understanding of the influence of redefinition requires clarification and extension.

Surprisingly, there appears to be only one experiment (Houston & Holmes, 1974a) dealing with the effectiveness of avoidant thinking for reducing stress.

In that experiment, subjects were threatened with electrical shocks and then either were or were not encouraged to divert their attention to a nonstress stimulus (an amusing story). Contary to the predictions, the results indicated that subjects whose attention was diverted by the story evidenced higher levels of physiological arousal than nondiverted subjects. Subsequent analyses indicated that subjects whose attention had not been diverted took the opportunity to redefine the threat as less serious and thereby reduced their arousal relative to the diverted subjects who did not have the opportunity to redefine the situation. While these findings appear to place limits on the stress reducing function of avoidant thinking, they certainly do not preclude that function. It may be that avoidant thinking is effective in reducing stress in nonambiguous threatening situations which do not lend themselves to redefinition, a possibility which remains to be explored.

At this point it should be noted that there are several correlational studies related to the effect on stress of avoidant thinking. It has been reported that subjects who elected to avoid thinking about a forthcoming stress showed higher levels of physiological arousal than subjects who elected to attend to the stress (Averill & Rosenn, 1972; Hare, 1966), although the opposite has also been reported (Monat, Averill, & Lazarus, 1972). While interesting and suggestive, because of the correlational nature of these investigations their results must be interpreted with caution. It may be, for example, that the spontaneous use of avoidant thinking and the nature of the response to stress are all due to some other, as yet unspecified, factor.

From the preceding comments it should be clear that the existing data do not provide answers for the questions of whether redefinition and avoidant thinking are effective in reducing stress. This is unfortunate in view of the theoretical and potential practical importance associated with these strategies. The present experiment was conducted to provide additional data and, hopefully, some of the needed answers. In this experiment, subjects in the Threat Conditions were told that they would receive a series of painful electrical shocks and then the subjects were given a sample shock. After that, the experimenter acknowledged the stressful nature of the situation but instructed the subjects to either redefine the threat (i.e., write down reasons why they should not be afraid), avoid thinking about the threat (i.e., read a humorous story), or simply sit quietly while waiting for the shocks. In contrast to the procedures in some previous experiments, then, in this experiment (a) the subjects were threatened directly, (b) the threat was nonambiguous, and (c) the subjects were required to employ the strategies themselves. Two other methodological points should also be noted: First, to eliminate the possibility that the results would be due to subjects faking what appeared to be the desired responses, physiological measures which have been shown to be impervious to faking (Houston & Holmes, 1974b) were used in addition to self-reports of stress. Second, because of the use of both redefinition and avoidant thinking was manipulated, this experiment provided an opportunity to examine the relative effectiveness of the two strategies in addition to the absolute effectiveness of each strategy, thus adding a dimension not found in many previous investigations.

Method

Subjects and Design

Subjects in this experiment were 192 female students from introductory psychology classes at the University of Kansas. They were randomly assigned in equal numbers to the 12 conditions formed by the 3 (Coping Strategies) x 2 (Threat) x 2 (Expectancies) factorial design.

Procedure

When a subject arrived for her appointment, she was told that the experiment involved studying "the factors which influence people's mood and physiological process," she was given a tour of the laboratory which included a demonstration of the polygraph, and then she was taken to an adjoining room where she was seated at a table. The experimenter then attached the plethysmographic finger transducer and two skin resistance electrodes to the subject's nondominant hand. As each was attached, its nature and function was explained and the subject was assured that it could not shock or hurt her in any way.

Base period and measurements. After the transducer and electrodes were attached and the subject was comfortable, the experimenter asked the subject to fill out the Today form of the Affect Adjective Check List (AACL: Zuckerman, 1960) and then went to the control room where he monitored the polygraph. The AACL is a state measure of subjective stress, and the subject's responses to that inventory as well as her physiological responses which were obtained simultaneously were used as the measures of the subject's base level of stress.

Threat manipulation. After the base measures were obtained, tape recorded instructions were used to give the subject additional information about the procedure for the next portion of the experiment and these differed as a function of the condition to which the subject had been assigned. A subject in the Threat Condition was told that the purpose of the experiment was to study reactions to electrical shocks and that she could expect to receive a number of electrical shocks of increasing intensity. In contrast, a subject in the Nonthreat Condition was told that the purpose of the experiment was to study the after-effects of electrical shock and that she would receive only one low-level shock. At that point, the experimenter entered the room and, if the subject agreed to continue in the experiment (11 Threat and 7 Nonthreat subjects withdrew and were replaced by running additional subjects), he attached two shock electrodes to the subject's nondominant hand and then returned to the control room.

The tape recorded instructions went on to explain to all subjects that they would receive a low-level shock and that the time interval following that shock would be divided into two periods which would be demarcated by sounds from a buzzer. In the Threat Condition, the subject was told that the first period would be a two-minute wait period which was necessary for the shock machine to be

readied for the more intense shocks and that the second period was the shock period during which she would receive shocks at random intervals. For the Nonthreat subject, both periods were described as wait periods and no particular importance was attached to them other than that they would be used to measure the subject's post-shock responses.

Coping manipulation. After threat had been manipulated, the use of the coping strategies was introduced. A subject assigned to the Avoidant Thinking Condition was told via the tape recorded instructions that

To occupy your time during the experimental periods, we want you to read the book which is on the table in front of you. So when you hear the one buzzer, open up the book and read the story quietly to yourself. We want you to become as involved in the story as possible. Later on we will ask you to evaluate how entertaining this story would be for first grade children and how the story could be changed to make it more entertaining for first grade children. So read it slowly and carefully.

The book which the subject read was an easily read, rather amusing children's book (Mattel, 1969).

A subject assigned to the Redefinition Condition was told via the tape recorded instructions to write down reasons why she should not be nervous or upset about receiving shocks in this experiment. It might be noted that a subject in the Nonthreat-Redefinition Condition was assured that she would not receive any shocks after the initial low-level shock but was asked to write reasons as if she expected shocks. Specifically, in the Redefinition Condition the subject was told that

When you hear the first buzzer, start out by writing down, "I am not (would not be) nervous or upset about additional shocks because..." and then write out a description of all the reasons you can think of why you should not be nervous or upset in the experiment. If you finish early, recopy your reasons on a second sheet of paper. We want you to become as involved in thinking of reasons and elaborating on them as possible...so do the best you can.

A subject assigned to the Control Condition was simply told to sit quietly during the periods.

Expectancy manipulation. After the coping strategies were introduced expectancies concerning their effectiveness were manipulated. Although they were not of any particular theoretical interest in this investigation, expectancies were manipulated because in many previous experiments high expectancies for the effectiveness of the strategies had been established in the subjects and it seemed necessary to determine whether these had any influence. A subject assigned to the High Expectancy Condition was told via the tape recorded instructions that in the past it had been found that subjects who used the coping strategy which had been explained (i.e., avoidant thinking, redefinition, sitting quietly) were more calm and relaxed during the experiment. Nothing was said concerning the effectiveness of the coping strategies to a subject in the Normal Expectancy Condition.

Initial shock. After the threat, coping, and expectancy manipulations had been completed, each subject received one low-level brief shock (.30 milliamperes for .10 second) which was delivered after a warning signal. In the case of a Nonthreat subject, the experimenter then entered the room, removed the shock electrodes, and assured the subject that she would not receive additional shocks.

Anticipation periods and measurements. After the initial low-level shock had been administered, the tape recorded instructions briefly reviewed the procedures for the remaining portion of the experiment. Specifically, each subject was reminded that there would be two periods demarcated by buzzers; each subject in the Threat Condition was reminded that she would receive shocks of increasing intensity on a random schedule during the second period; and each subject was reminded to either read the book, write reasons why she was not afraid of shocks, or sit quietly during the two periods. The buzzer then sounded indicating the beginning of the first period. Ninety seconds later the subject was briefly interrupted and asked to complete an AACL in terms of how she felt at that point (i.e., while she either was or was not anticipating shocks). Thirty seconds after the AACL was completed, the buzzer sounded again indicating the end of the first period and the beginning of the second period. After ninety seconds the buzzer sounded again indicating the end of the second period and then the tape recorded instructions asked the subject to complete an AACL in terms of how she had felt during the second period (i.e., while she either was or was not expecting shocks).

In addition to the subjective measures of stress obtained through the use of the two AACL's, physiological measures of stress were obtained for five intervals: the first, middle, and last 30 seconds of the first period and the first and last 30 seconds of the second period.

Debriefing. After the subject completed the last AACL, the experimenter entered the room, detached the physiological equipment, and gave the subject a complete explanation of the nature and purpose of the experiment. The subject was then asked not to discuss the experiment with other students, thanked for her cooperation, and dismissed.

Results and Discussion

Measures

It will be recalled that physiological measures (pulse rate, finger pulse volume, skin resistance) were obtained during six 30-second periods; the base period and, of more importance, five experimental periods (i.e., periods while the subjects using different coping strategies were or were not waiting for additional shocks). In order to rule out the frequently found influence of basal levels on the magnitude of responses given in later periods (i.e., the "law of initial values"; Lacey, 1956; Wilder, 1962), a base-free measure of change was desirable

(Benjamin, 1967; Tucker, Demarin & Messick, 1966). Therefore, "residualized" scores (cf. Cronbach & Furby, 1970) were calculated for the physiological responses obtained during the five experimental periods. A residualized score consisted of the difference between the obtained score during the experimental period and the score predicted by linear regression from the respective base level score. Described in another way, residualized scores are scores which have been adjusted for base level values.

Subjective stress was measured with the AACL for three periods; the base period and two experimental periods. Residualized AACL scores were calculated for the two experimental periods.

Adequacy of Manipulations

Before attempting to determine whether the various coping strategies were effective in reducing stress, it was necessary to determine whether the threat manipulation was effective in increasing stress and whether the avoidant thinking and redefinition manipulations were successful in inducing subjects to engage in the intended behaviors.

Threat Manipulation. All four measures clearly indicated that the threat manipulation was successful in increasing subjects' stress. This was attested to by the significant Threat effects generated by each of the 3 (Coping Strategies) x 2 (Threat) x 2(Expectancies) x 5 (Periods) analyses of variance which were conducted on the pulse rate, F (1,180) = 61.12, $p < .001$, finger pulse volume, F (1,180) = 57.01, $p < .001$, and skin resistance, F (1,180) = 4.15, $p = .04$, data and the 3 (Coping Strategies) x 2 (Threat) x 2 (Expectancies) x 2 (Periods) analysis of variance conducted on the AACL data, F (1,180) = 64.52, $p < .001$.[2] In addition, significant Threat x Periods interactions were found in the analyses conducted on the pulse rate, F (4,720) = 8.03, $p < .001$, and finger pulse volume data, F (4,720) = 4.69, $p = .001$. Inspection of the data indicated that the interactions were due to the fact that after remaining relatively constant across the first three periods, stress increased substantially in the fourth period when the possibility of shock became imminent and then declined in the fifth period as the time for receiving shock expired.

Avoidant Thinking and Redefinition Manipulations. The check on the avoidant thinking manipulation was twofold. One, subjects were observed during the experimental periods during which they were supposed to read the story. They were observed to evaluate to what extent they appeared to be reading the story (viz., looking at the pages, turning them, etc.) as opposed to looking around the room, starring, etc. During the experimental periods, all subjects appeared to be reading the story and none spent time in nonreading activities. Secondly, at the conclusion of the experimental periods, all subjects evaluated how entertaining the story would be for first grade children and each had some kind of comment concerning how the story could be changed to make it more entertaining for the children, which further indicates that subjects had attended to the story. Thus

the check indicated that subjects focused their attention on the story at least part of the time during the experimental periods.

To check on the redefinition manipulation, the responses written during the experimental periods by subjects in the Threat-Redefinition condition were rated independently by two judges for evidence of redefinition of the stressful situation. Redefinition was operationally defined as having occurred if the subject responded with one or a combination of the following: minimizing the strength or effect of the shock, disavowing that the shocks concerned him, would be painful or would occur; or adopting a detached, analytical, or positive attitude toward the shocks. The judges achieved 95% agreement thus indicating a significant ($p < .001$) degree of interjudge reliability. This evaluation revealed that 97% of the subjects' responses involved redefinition while only 3% did not. Of the latter, three-fourths, or two percent of the statements, indicated that the subject had engaged in avoidant thinking, and one-fourth, or one percent of the statements, indicated a lack of coping, i.e., an unmitigated expression of apprehension. The check thus indicates that the manipulation was generally very effective in inducing subjects to engage in cognitive redefinition of the stressful situation.

Effectiveness of the Coping Strategies

The overall analysis of the AACL data (see previous section) did not reveal any interactions involving Coping Strategies and Threat, thus indicating that in this experiment the AACL was not sensitive to the effects of the coping strategies on stress and therefore no further consideration was given to the AACL measure. On the other hand, the overall analyses of the physiological measures revealed the following interactions related to the influence of coping strategies: Coping Strategies by Threat for pulse rate, F (2,180) = 7.68, $p < .001$; Coping Strategies by Threat by Periods for skin resistance, F (8,720) = 3.32, $p = .001$; and Coping Strategies by Threat by Expectancies by Periods for finger pulse volume, F (8,720) = 2.23, $p = .02$. To clarify the nature of these interactions and the influence of the various coping strategies, subanalyses were conducted comparing each of the coping strategy conditions to the Control Condition and comparing the coping strategy conditions to one another.

Avoidant Thinking Versus Control. A 2 (Avoidant Thinking, Control) x 2 (Threat) x 2 (Expectancies) x 5 (Periods) analysis of variance was conducted on each of the physiological measures. These analyses revealed the following significant interactions: Coping Strategies by Threat for pulse rate, F (1,120) = 16.61, $p < .001$, and Coping Strategies by Threat by Periods for both skin resistance and finger pulse volume, Fs (4,480) = 4.54 and 2.57, ps = .001 and .04, respectively. To describe the nature of these interactions, 2 (Avoidant Thinking, Control) x 2 (Threat) analyses were conducted on each measure for each period. The pulse rate data indicated that avoidant thinking significantly reduced arousal during each of the five periods, Fs (1,900) = 7.57, 15.61, 7.86, 12.00, and 9.83, $p < .01$ in each case. The skin resistance data indicated that avoidant thinking

significantly reduced arousal during the fifth period, F (1,900) = 4.64, p = .03, and although the finger pulse volume data revealed the same trend, it was not statistically significant, F (1,900) = 2.07, p = .14. Generally the data indicated that subjects who were instructed to use avoidant thinking showed less physiological stress than subjects who were instructed to simply sit quietly, thus suggesting that avoidant thinking is an effective coping strategy.

Redefinition Versus Control. The 2 (Redefinition, Control) x 2 (Threat) x 2 (Expectancies) x 5 (Periods) analyses of variance conducted on each of the three physiological measures revealed the following significant interactions: Coping Strategies by Threat by Periods for skin resistance, F (4,480) = 3.29, p = .01, and Coping Strategies by Threat by Expectancies by Periods for finger pulse volume, F (4,480) = 3.26, p = .01. To describe the nature of these interactions, 2 (Redefinition, Control) x 2 (Threat)analyses of variance were conducted on each measure for each period for each level of expectancy. These analyses did not indicate that subjects who were instructed to use redefinition had lower levels of stress than subjects who were instructed to sit quietly, thus indicating that in this experiment redefinition was not an effective coping strategy.

Avoidant Thinking Versus Redefinition. The 2 (Avoidant Thinking, Redefinition) x 2 (Threat) x 2 (Expectancies) x 5 (Periods) analyses of variance conducted on each of the three physiological measures revealed the following significant interactions: Coping Strategies by Threat for pulse rate, F (1,120) = 8.01, p = .006, and Coping Strategies by Threat by Periods for finger pulse volume, F (4,480) = 2.35, p = .05. To describe the nature of these interactions, 2 (Avoidant Thinking, Redefinition) x 2 (Threat) analyses of variance were conducted on each measure for each period. The pulse rate data indicated that the subjects who were instructed to use avoidant thinking showed significantly lower stress during each period than did the subjects who were instructed to use redefinition, Fs (1,900) = 4.63, 10.61, 5.35, 11.55,and 5.11, $p < .03$ in each case. The finger pulse volume measure indicated similar trends but the differences were at or approached significant levels during only the last two periods, Fs (1,900) = .96, 1.69, .88, 5.06 (p = .02),and 2.73 (p = .09). Last, the trends were in the same direction for the skin resistance measure but none of the differences on that measure reached statistical significance. It appears, then, that in this experiment avoidant thinking was a more effective coping strategy than redefinition.

Graphic Presentation of Results. In an attempt to summarize and simplify the findings generated by the many preceding complex analyses, the pulse rate and finger pulse volume data have been presented graphically in Figure 1 (Parts A and B). It should be noted that in constructing this figure, the stress evidenced by subjects in each of the Nonthreat conditions was subtracted from the stress evidenced by subjects in the parallel Threat condition (e.g., the stress of the Nonthreat-Redefinition subjects was subtracted from the stress of the Threat-Redefinition subjects). Therefore, a deflection upward of a curve for any coping strategy condition reflects an increase in stress and a deflection downward reflects a decrease in stress relative to the appropriate nonthreat condition. This type of

presentation greatly facilitates interpretation of the figures without an appreciable loss of data.

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Insert Figure 1 about here

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Consistent with the results of the previously presented analyses, both figures reveal the relatively low level of stress of subjects in the Avoidant Thinking Condition.

Effect of Reading and Writing on the Physiological Measures

A potential concern in interpreting the results of this study needs to be considered. One could question whether the act of reading in the Threat-Avoidant Thinking condition or writing in the Threat-Redefinition condition might have increased or decreased physiological arousal in ways that would have produced, in and of themselves, the results of this study. This question, however, should be answered by keeping in mind that the design of the experiment and the analyses included comparison groups (viz., Nonthreat-Avoidant Thinking and Nonthreat-Redefinition) to control for extraneous factors such as the physiological effects of reading or writing.

Conclusions and Implications

The results of this investigation clearly and consistently indicated that avoidant thinking was an effective strategy for reducing physiological stress in the face of impending shock. Specifically, avoidant thinking was more effective than redefining the stressful situation or simply sitting quietly. This is the first experimental demonstration of the effectiveness of avoidant thinking for reducing stress and finally provides empirical support for the many suggestions and speculations concerning its effectiveness. The fact that avoidant thinking was effective in this experiment while it was not found to be so in an earlier experiment (Houston & Holmes, 1974a) is probably due to either or both of two factors: First, in the previous experiment the subjects were simply asked to read a story while in this experiment they were asked to read a story but also asked to evaluate the story and develop ways it could be improved. This greater and more active involvement with the avoidant thinking may have contributed to the success of the strategy. Second, the ambiguity of the threat to be avoided may influence the effectiveness of the avoidance strategy. That is, when threat is nonambiguous (i.e., when a sample shock is given) avoidant thinking may be more easy and effective than when threat is ambiguous (i.e., when no sample shock is given).

The results of the present experiment also provide an interesting suggestion concerning when the use of redefinition will and will not be effective for reducing stress. It will be recalled that in this experiment redefinition was not effective in reducing stress but that in two earlier experiments (Holmes & Houston, 1974;

Houston & Holmes, 1974a) redefinition was effective. The factor which appears to distinguish between experiments in which redefinition was and was not effective is the ambiguity of the threat to be redefined. It seems that when threat is ambiguous (i.e., when no sample shock is given) redefinition is relatively easy and effective but when threat is nonambiguous (i.e., when a sample shock is given) redefinition is more difficult and therefore the attempt is less effective.

Overall, the present data add to and complement the existing data on coping strategies in two ways. First, they provide the first evidence that avoidant thinking can be effective in reducing stress and, second, they suggest the circumstances under which avoidant thinking and redefinition will and will not be effective. In view of the growing body of experimental data (e.g., Bloom & Houston, 1975; Holmes, 1968, 1974; Holmes & Houston, 1971) which raises serious questions concerning the effectiveness or even the existence of some of the traditionally accepted "defense mechanisms", the data documenting the effectiveness of a strategy is of particular importance and the data denoting the variables which influence strategy effectiveness are critical for future theory building and research.

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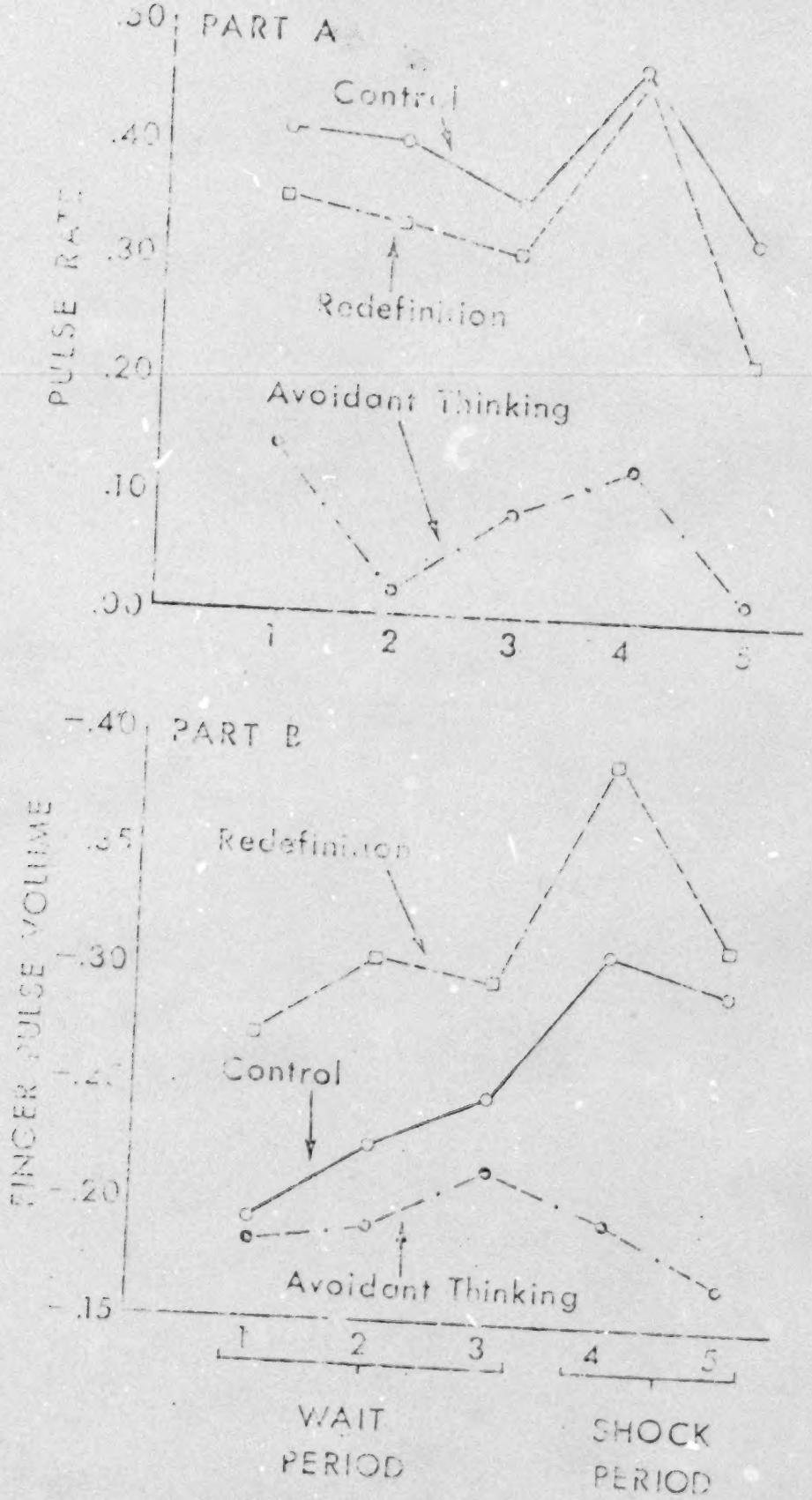
Figure Caption

Fig. 1. Pulse rates (Part A) and finger pulse volumes (Part B) in the Avoidant Thinking, Redefinition, and Control Conditions during the periods in which subjects were waiting for and expecting shocks. All scores were "residualized" to eliminate the influence of basal levels. Deflections in curves reflect changes in threatened subjects relative to nonthreatened subjects in the same coping strategy condition (see text for more complete description).

Footnotes

[1]Requests for reprints should be sent to B. Kent Houston, Department of Psychology, University of Kansas, Lawrence, Kansas 66045. This research was supported in part by Research Grant MH 20819 to David S. Holmes.

[2]*F* values not reported were either not statistically significant, qualified by higher order interaction effects, or theoretically unimportant and not consistently found across measures.


PART A
PULSE RATE
.50
.40
.30
.20
.10
.00
Control
Redefinition
Avoidant Thinking
1
2
3
4
5
PART B
FINGER PULSE VOLUME
.40
.30
.20
.15
Redefinition
Control
Avoidant Thinking
1
2
3
4
5
WAIT PERIOD
SHOCK PERIOD